03M09B6

narda

the narda microwave corporation
MINEOLA, NEW YORK

OPERATING INSTRUCTIONS

NARDA HIGH-POWER IMPEDANCE METER

narda

OPERATING INSTRUCTIONS

NARDA HIGH-POWER IMPEDANCE METER

Description

The Narda High-Power Impedance Meter is designed to measure the impedance of waveguide components and systems at power levels up to the breakdown power of the waveguide. The instrument consists essentially of an electroformed section of precision waveguides with a travel carriage on the top surface.

Through appropriate bends the center portion of the main waveguide is displaced upwards so that the top of the inside surface of the waveguide is in the same plane as the outer top surface. Thus, there is no top wall on this section. The open section is covered with a sliding carriage containing an iris which couples energy to the auxiliary waveguide. The auxiliary waveguide terminates at the top surface of the carriage and a detector or mixer may be attached at this point. The power in the auxiliary waveguide is approximately 45 db below the main waveguide power. If adjustment of the power level to the detector is desired, a waveguide attenuator may be mounted between the detector and the auxiliary waveguide.

The sliding surfaces on the carriage and the main waveguide depend on pressure contact for a good electrical joint. For this reason, the surfaces are ground extremely flat and lapped smooth. The outer surfaces are finished in hard chrome to minimize wear and the inside of the waveguide is silver plated for good electrical conductivity. Care should be taken to keep the sliding surfaces clean and free of dirt. The pressure between the surfaces has been adjusted at the factory for proper operation, and the adjusting screws at the rear of the carriage should not be touched.

Specifications

Frequency (kmc)	Waveguide (in)	Maximum Residual VSWR	Output Coupling	Peak* Power	NARDA Model	Lgth (in)	Price
3.95-5.85	2 x1	1.02	45 db	1000 kw	213	19-5/16	$2175.
5.30-8.2	1-1/2x3/4	1.02	45 db	500 kw	212	15	1975.
7.05-10.0	1-1/4x5/8	1.02	45 db	460 kw	211	12	1700.
8.20-12.4	1 x1/2	1.02	45 db	300 kw	210	12	1375.
12.4-18.0	.702 x.391	1.03	45 db	250 kw	209	12	1700.

* Power Rating in matched line.

Scale.....direct reading to 0.5 mm
Vernier.....reads to 0.05 mm
Finishings.....conducting surfaces silver plated; other parts, hard chrome
Flanges.....plain cover flanges mate with UG cover or choke flange.

Measuring Impedance

The impedance of a load terminating the High-Power Impedance Meter can be measured in the conventional manner, by determining the magnitude and position of the standing wave in the line. It should be noted that since the auxiliary waveguide is iris coupled to the main waveguide, the peaks and nodes measured along the waveguide are proportional to the current peaks and nodes, rather than the more commonly used voltage standing wave. Therefore, to determine impedance, it is necessary to use a convention different from that used with voltage standing wave data. The voltage minimum, which is usually measured for impedance data, occurs 1/4 guide wave length from the minimum as measured on the Narda High-Power Impedance Meter.

The position of the coupling iris can be read on the carriage scale. This reading indicates the effective distance from the iris to the right hand flange surface of the impedance meter. This takes into account the additional length of line due to the bends in the waveguide. A detailed description of impedance measurement technics can be found in Chapter 8, Volume II of the MIT Radiation Labs., series, C.G. Montgomery, "Technics of Microwave Measurements."

Frequency Limits

The Narda High-Power Impedance Meter is designed to operate over the full waveguide band with the lower frequency limit determined by the carriage motion. However, enough motion is provided for operation well below the lower recommended frequencies of the respective waveguide.

Mounting

The instrument normally mounts on a bench for use in bench test setups. The adjusting screws on the mounting seat permit an adjustment of the height above the bench. Heavy waveguide components should be separately supported to avoid straining the impedance meter flanges.

The unit may be mounted in a waveguide system with the mounting seat removed if care is taken to prevent undue stress on the flanges.

It will operate in any position when mounted in this manner.